



# Lower Duwamish Waterway Source Control Strategy

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## Lower Duwamish Waterway Source Control Strategy

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# Table of Contents

	<u>Page</u>
List of Figures and Tables.....	ii
Abstract .....	iii
Acknowledgements .....	iv
Acronyms/Abbreviations .....	v
Executive Summary .....	vi
Lower Duwamish Waterway Site .....	1
Goals and Priorities .....	5
Goals .....	5
Priorities .....	6
Regulatory Framework .....	9
Source Control Work Group .....	9
Roles and Responsibilities .....	11
Total Maximum Daily Loads (TMDLs/Pollution Control Plans).....	16
Persistent Bioaccumulative Toxins.....	17
Contamination and Pathways.....	18
Steps to Identify and Manage Sources.....	20
Tools to Manage Sources.....	21
Source Control Effectiveness and Completeness .....	23
Documentation, Tracking, and Reporting.....	25
Documentation and Tracking.....	25
Reporting.....	27
Public Involvement .....	31
Bibliography .....	32

## Appendices

- A. Draft Action Plan Table of Contents for Duwamish/Diagonal Way
- B. Source Control Work Group Authorities and Regulations

# List of Figures and Tables

	<u>Page</u>
<b>Figures</b>	
Figure 1. Lower Duwamish Waterway Superfund Site .....	2
Figure 2. Early Action Candidate Sites.....	3
Figure 3. Hypothetical Tier 3 Areas .....	8
Figure 4. City/County Boundaries .....	10
<b>Tables</b>	
Table 1. Documentation and Tracking Requirements .....	24
Table 2. Reporting Requirements .....	26

## Abstract

The Lower Duwamish Waterway is located in Seattle, Washington, and is approximately five miles long. The U.S. Environmental Protection Agency (EPA) added the waterway to the Superfund list on September 13, 2001. Contaminants found in waterway sediments include polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), mercury and other metals, and phthalates. These contaminants may pose threats to people, fish, and wildlife.

In December 2000, EPA and the Washington State Department of Ecology (Ecology) entered into an order with King County, the Port of Seattle, the City of Seattle, and The Boeing Company. The purpose of the order is to perform a Remedial Investigation and Feasibility Study of the waterway sediment contamination, in order to assess potential risks to human health and the environment, and evaluate cleanup alternatives. The EPA is the lead agency for the Remedial Investigation and Feasibility Study. Ecology is the lead agency for controlling current sources of pollution to the site, in cooperation with the City of Seattle, King County, the Port of Seattle, the City of Tukwila and the EPA. The purpose of this strategy is to outline the major source control program elements for the Lower Duwamish Waterway site.

Preventing recontamination to levels exceeding the Sediment Management Standards (Washington Administrative Code [WAC] 173-204) and the Lower Duwamish sediment cleanup goals is the ultimate focus of this strategy. The Lower Duwamish source control program will be designed to identify and manage sources of chemicals to waterway sediments in coordination with sediment cleanups. This strategy will provide the framework and process for identifying source control issues and implementing effective controls.

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- Kristine A. Flint, Region 10, U.S. EPA Environmental Cleanup Division
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# Acronyms/Abbreviations

CSO – Combined Sewer Overflow

Ecology – Washington State Department of Ecology

EPA – United States Environmental Protection Agency

LDW – Lower Duwamish Waterway

MTCA – Washington State Model Toxics Control Act

NPDES – National Pollutant Discharge Elimination System

PAHs – Polycyclic Aromatic Hydrocarbons

PBTs – Persistent Bioaccumulative Toxins

PCBs – Polychlorinated biphenyls

RCRA – Resource Conservation and Recovery Act

RI/FS – Remedial Investigation/Feasibility Study

RM – River Mile

ROD – EPA Record of Decision

SCWG – Source Control Work Group

SMC – Seattle Municipal Code

SMS – Washington State Sediment Management Standards

SPU – Seattle Public Utilities

Superfund – Comprehensive Environmental Response Compensation Liability Act (CERCLA)

TMDL – Total Maximum Daily Load

WAC – Washington Administrative Code

## Executive Summary

The purpose of this document is to provide the framework and process for identifying source control issues and implementing effective controls for the Lower Duwamish Waterway (LDW). The basic source control strategy for the LDW site is to identify and manage sources of chemicals to site sediments in coordination with sediment cleanups. The goal of this strategy is to minimize the potential for chemicals in sediments to exceed the Sediment Management Standards (WAC 173-204) and the LDW sediment cleanup goals. This will be achieved by using existing administrative and legal authorities to perform inspections and require necessary source control actions. It is important to note that recontamination may occur even with an aggressive source control program, due to the difficulty in identifying and completely controlling all possible sources. However, preventing recontamination to levels exceeding sediment cleanup goals is the ultimate purpose of this strategy.

This strategy for identifying source control issues, and implementing controls and monitoring, will provide the agencies with a process to address source control work. This general strategy will be the basis for the development of a series of detailed area-specific Action Plans that will be coordinated with sediment cleanups. These Action Plans will document when adequate source control is achieved for an area, so that sediment cleanup may begin. Because the scope and extent of source control requirements for the site will be defined by specific areas, one area at a time, it is essential that flexibility to adapt the strategy to specific situations be maintained. In addition, the success of this strategy is dependent on the cooperation of all public agencies with authority and/or responsibility for source control in the LDW area, and the businesses that must make changes to achieve source control.

The focus of this source control strategy is on contamination that impacts Lower Duwamish Waterway sediments. This focus is based on the principles of source control for sediment sites described in EPA guidance (Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites; EPA, February 12, 2002), and Ecology's Sediment Management Standards (WAC 173-204). The first principle is to control sources early, starting with identifying all ongoing sources to the site. EPA's Record of Decision (ROD) for the site will require that sources of sediment contamination to the entire site be evaluated, investigated, and controlled as necessary. Dividing source control work into specific Action Plans and prioritizing those plans to coordinate with sediment cleanups will address the guidance and regulations, and will be consistent with the EPA ROD.

# Lower Duwamish Waterway Site

In 1999, the U.S. Environmental Protection Agency (EPA) completed a study of approximately five miles of the Lower Duwamish Waterway, from the southern tip of Harbor Island to just south of the turning basin near the Norfolk combined sewer overflow (see Figure 1). Contaminants found in the waterway include PCBs, PAHs, mercury and other metals, and phthalates. These contaminants may pose threats to people, fish, and wildlife.

In December 2000, EPA and Ecology entered into an order with the City of Seattle, King County, the Port of Seattle, and The Boeing Company (known for this project as the Lower Duwamish Waterway Group). Under the order, the Waterway Group is performing a Remedial Investigation and Feasibility Study (RI/FS) for Lower Duwamish Waterway sediment contamination, assessing potential risks to human health and the environment, and evaluating cleanup alternatives. This work is divided into two phases. Phase 1 uses the existing data for the site in order to identify high priority candidate areas for cleanup (known as early action candidate sites), to identify initial human health and ecological risks posed by the site, to identify gaps in the existing data and produce a work plan to fill those gaps. Phase 1 work began in January 2001, and is scheduled to be completed by the winter of 2003/2004. Phase 2 consists of sampling work to fill the data gaps, and further risk assessment work. If significant risks are identified based on Phase 2 work, then further cleanup actions will be necessary. The Phase 2 schedule will be set by the winter of 2003/2004.

EPA added the Lower Duwamish Waterway site to the Superfund list on September 13, 2001. This is EPA's list of the nation's most contaminated hazardous waste sites that are targeted for investigation and cleanup. The Washington State Department of Ecology (Ecology) added the site to the Washington State Hazardous Sites List on February 26, 2002.

In April 2002, EPA and Ecology signed an interagency Memorandum of Understanding, dividing work responsibilities for the site (Ecology/EPA 2002). EPA is the lead for the Phase 1/Phase 2 sediment investigation work, and Ecology is the lead for the source control work. EPA will also be the lead for managing at least two of the early action cleanups (Area 5: Terminal 117/Malarkey and Area 4: Slip 4).

Based on current Phase 1 work, seven early action candidate sites (see Figure 2) have been proposed by the Waterway Group (Windward 2003):

- Area 1: Duwamish/Diagonal combined sewer overflow and storm drain (CSO/SD) on the east side of the waterway (river mile [RM] 0.4 – 0.6).
- Area 2: RM 2.2, on the west side of the waterway, just south of the 1<sup>st</sup> Avenue S. bridge.
- Area 3: Slip 4 (RM 2.8).
- Area 4: Located south of Slip 4, on the east side of the waterway, just offshore of the Boeing Plant 2 and Jorgensen Forge properties (RM 2.9 to 3.7).

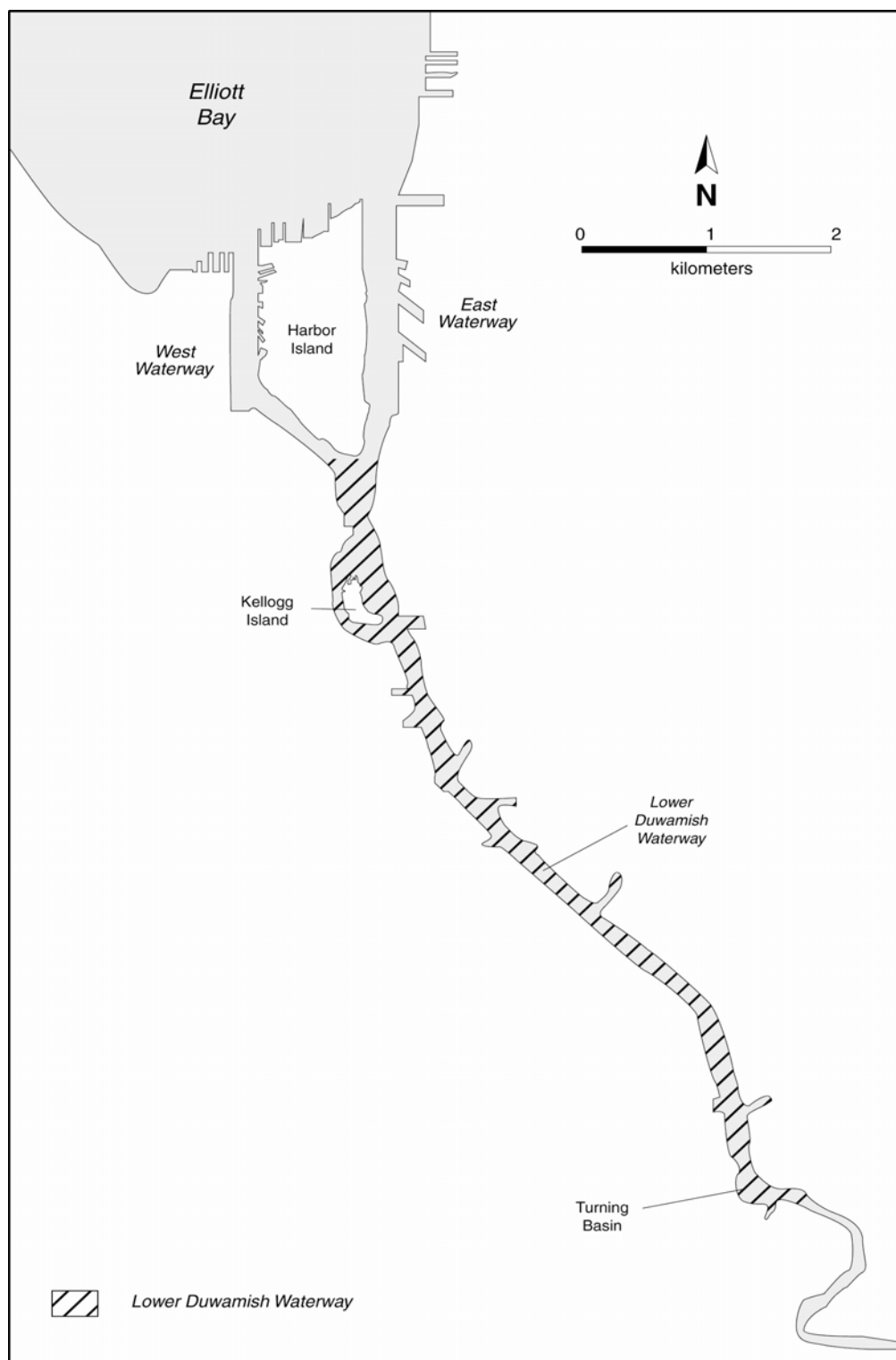


Figure 1. Lower Duwamish Waterway Superfund Site (Seattle, WA). Windward 2000.

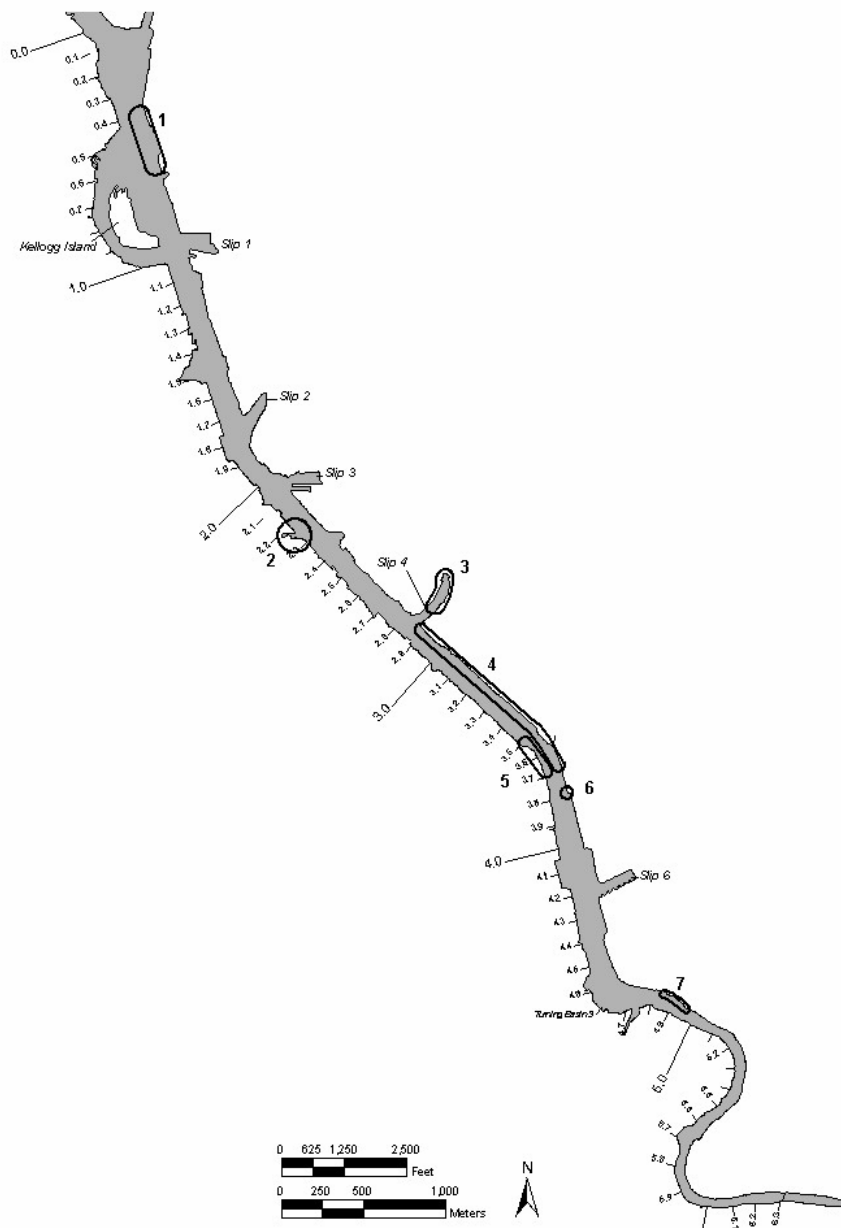


Figure 2. Candidate Sites Proposed by Lower Duwamish Waterway Group for Early Action (numbers on east bank represent river miles). Windward 2003.

- Area 5: Terminal 117/Malarkey, located at approximately RM 3.6, on the west side of the waterway.
- Area 6: RM 3.8, on the east side of the waterway.
- Area 7: Norfolk CSO (RM 4.9 – 5.5), on the east side of the waterway.

From the candidate sites proposed by the Waterway Group, the agencies will select, plan and implement priority early action cleanups that will be done concurrent with the Phase 2 investigation work.

Two cleanups, Duwamish/Diagonal Way and Boeing Plant 2, were started before the Phase I work was begun. Cleanup dredging at Duwamish/Diagonal Way (King County under the Elliott Bay/Duwamish Restoration Program) began in November 2003, and is scheduled to be complete in February 2004. Boeing Plant 2 is in the planning phase (Boeing Company under the EPA Resource Conservation and Recovery Act [RCRA] program).

# Goals and Priorities

The purpose of this document is to outline the major source control program elements for the Lower Duwamish Waterway (LDW) site. This strategy will be the basis for the development of a series of detailed area-specific Action Plans that will be coordinated with LDW sediment cleanups. The interagency Source Control Work Group (see Regulatory Framework) will be active participants in developing the Action Plans. An example of a draft Action Plan outline for Area 1: Duwamish/Diagonal Way, is provided in Appendix A.

## Goals

Preventing recontamination to levels exceeding sediment cleanup goals is the ultimate focus of this strategy. The LDW source control program will be designed to identify and manage sources of chemicals to waterway sediments in coordination with sediment cleanups. It is important to note that recontamination may occur even with an aggressive source control program, due to the difficulty in identifying, and controlling all possible sources. This strategy provides the framework and process for identifying source control issues and implementing effective controls. The success of this strategy depends on the cooperation of the public agencies that have the authority and/or responsibility to regulate sources, the parties that own or control property where sources are located, and the businesses that must make changes to achieve source control.

Specific goals for the source control program are:

- Minimize the potential for chemicals in sediments to exceed WAC 173-204 the Sediment Management Standards (SMS) and the LDW sediment cleanup goals (to be established in a future LDW ROD).
- Achieve adequate source control that will allow sediment cleanups to begin.
- Increase opportunities for natural recovery of sediments.
- Support long-term suitability and success of current and future habitat restoration opportunities.

These goals will be met by achieving the following program objectives:

- Identify the nature and extent of ongoing sources of chemicals to LDW sediments that have the potential to exceed SMS criteria or LDW sediment cleanup goals, in coordination with the timing of sediment cleanups.
- Schedule source control activities in the upland basins tributary to contaminated sediment areas to coordinate with sediment cleanup activities.

- Use existing administrative and legal authorities to require corrective actions at commercial and industrial businesses, and other facilities in areas tributary to contaminated areas.
- Educate business people and residents on ways to reduce pollution from their activities.
- Evaluate and monitor the success of source control efforts and revise plans accordingly.
- Establish milestones and reporting requirements for source control activities.

## Priorities

*Focus on Sediments:* Source control will be focused on chemicals with the potential to exceed SMS criteria or LDW sediment cleanup goals. Soil, groundwater, surface water, or other contamination issues within the site vicinity that do not have the potential to exceed sediment cleanup goals will generally not be addressed by this source control program. Instead they will be referred to the appropriate agency and program for action.

Source control work will be divided into the four tiers described below:

### Tier One

This tier consists of source control work associated with early action sediment cleanups. Action Plans will be developed and implemented for each early action cleanup. The four early action cleanups listed below are in priority order for Action Plan development and source control work, based on projected cleanup schedules:

- Area 1: Duwamish/Diagonal Way Combined Sewer Overflow/Storm Drain – Work being performed by King County. This seven-acre cleanup began in November 2003 and is scheduled to be complete in February 2004.
- Area 5: Terminal 117/Malarkey (property recently acquired by the Port of Seattle) – Work being performed by the Port of Seattle. Size undefined at this time. Projected cleanup in the fall of 2004.
- Area 3: Slip 4 – Work to be performed by the City of Seattle. Size undefined at this time. Projected cleanup in 2005/2006.
- Area 4: Boeing Plant 2 – Work being performed by The Boeing Company. Size undefined at this time. Projected cleanup in 2005+.

The three remaining early action candidates: Area 2: RM 2.2, Area 6: RM 3.8 and Area 7: Norfolk Combined Sewer Overflow may be selected by the agencies as early action cleanups, or they may be deferred to the Phase 2 study for further consideration. If and when EPA or



Ecology selects additional early action areas for cleanup, they will be added to Tier One. As more information becomes available, or if additional early action areas are selected, the agencies may adjust source control work priorities.

## Tier Two

This tier consists of source control work associated with any final, long-term sediment cleanup actions identified through the Phase 2 LDW Remedial Investigation work, and the EPA ROD. Action plans will be developed and implemented for each long-term cleanup.

## Tier Three

This tier consists of potential source control work necessary in basins draining to waterway sediments that have not been identified for early or long-term cleanup actions through the LDW RI/FS process (see Figure 3). The purpose of Tier Three source control is to prevent future contamination of the LDW above the sediment cleanup goals, in order to prevent the need for additional sediment cleanup actions.

Basins tributary to waterway sediments that are not early or long-term action cleanup areas will be evaluated for potential source control work. Evaluation will include information about the chemicals currently in sediments in these areas, information about activities in the basin that may cause pollution, and information gathered during routine agency inspections (see Steps to Identify and Manage Sources). This information will be reviewed by Ecology and the Source Control Work Group to determine whether further actions are necessary.

## Tier Four

This tier consists of any source control work identified by post-cleanup sediment monitoring. Post-cleanup monitoring of sediment sites is a requirement of the Sediment Management Standards. One of the goals of monitoring is to determine the occurrence, nature, and rate of any recontamination. If post-cleanup monitoring determines that recontamination is occurring at levels above the Sediment Management Standards or LDW cleanup goals, additional source control actions may be required by Ecology and/or EPA. If Tier Four source control work is necessary, an amendment to the existing Action Plan for that area will be completed.

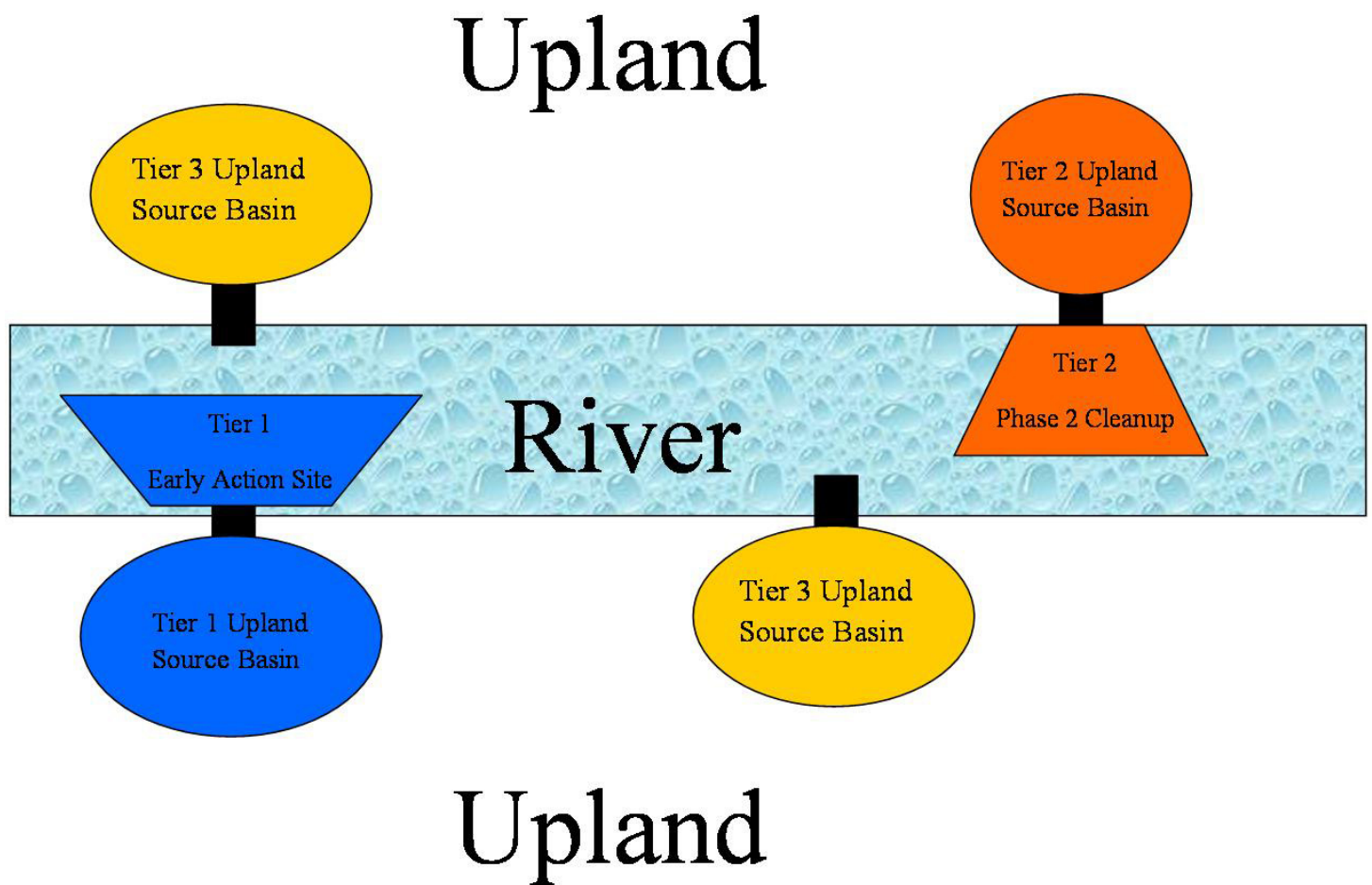


Figure 2. Hypothetical Tier 3 Areas

# Regulatory Framework

This strategy will use existing regulatory and management authorities to address source control needs for the waterway. Because regulatory authorities are delegated among various public agencies, it is critical that the authorities are clearly understood and coordinated in order to achieve the most effective source control efforts possible.

Public agencies, municipalities, the Port of Seattle, private property owners, businesses, and industry in the Lower Duwamish area are required to implement and/or operate under the appropriate regulations that address the protection of the environment. Appendix B presents a list of these authorities and regulations.

## Source Control Work Group

Based on existing statutes, regulations and codes, the primary public agencies responsible for source control for the site are Ecology, the City of Seattle, King County, Port of Seattle, City of Tukwila, and the EPA. Toward the southern end of the site, the boundaries that divide King County, City of Seattle, and City of Tukwila intersect, as shown in Figure 4. Although the Port of Seattle carries no direct or delegated authority for source control, it does exert influence on its tenants that can positively affect source control.

In order to coordinate among these agencies, Ecology formed the Source Control Work Group (SCWG) in January 2002. The purpose of the SCWG is to share information, discuss strategy, actively participate in developing Action Plans, jointly implement source control measures, and share progress reports on source control activities for the LDW area. SCWG meetings are chaired by Ecology and are held monthly. All final decisions on source control actions and completeness will be made by Ecology, in consultation with EPA, as outlined in the April 2002 Ecology/EPA LDW Memorandum of Understanding (Ecology/EPA 2002).

Other public agencies with relevant source control responsibilities include the Washington State Department of Transportation, Puget Sound Clean Air Agency, and the Seattle/King County Department of Public Health. These agencies will be invited to participate as appropriate.

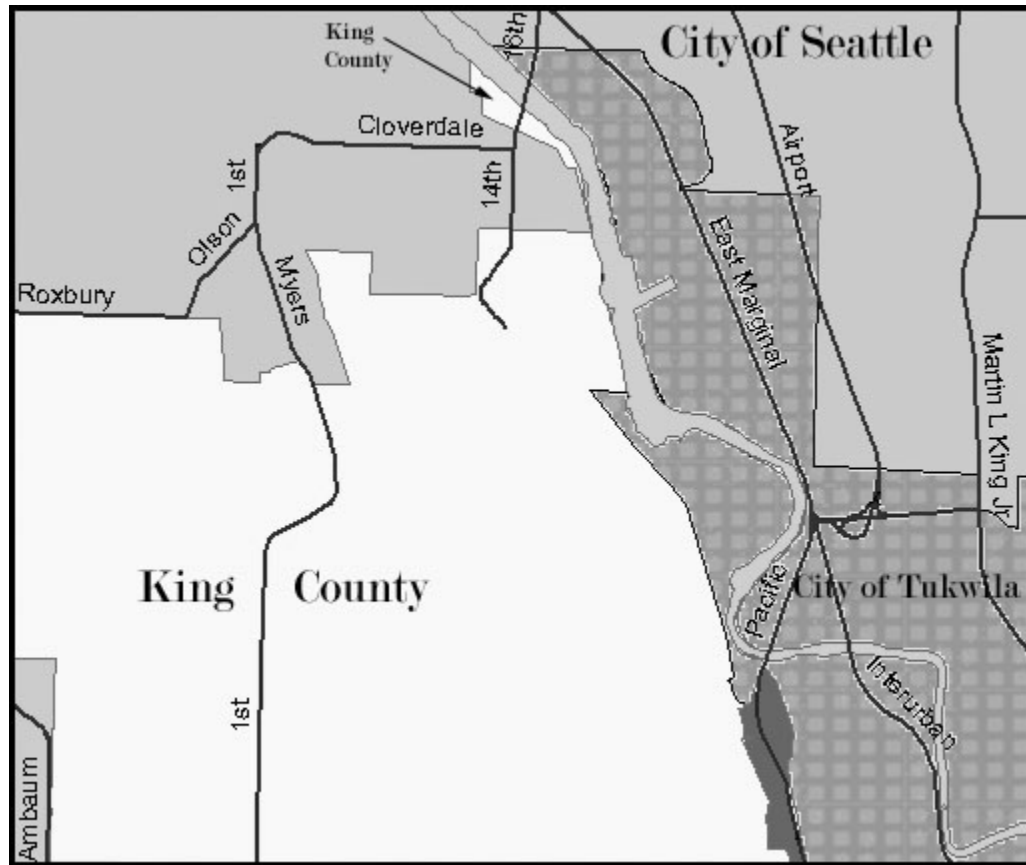


Figure 4. Intersection of City of Seattle, City of Tukwila, and King County boundaries. Note section of King County at 16<sup>th</sup> & Cloverdale.

## Roles and Responsibilities

The roles of the SCWG agencies are described below. Any additional roles that may be developed will be described in the area-specific Action Plans. Roles for other public agencies may also be developed as information collection and source control proceeds.

### Ecology

Ecology has broad roles and responsibilities under the Memorandum of Understanding and this strategy. Ecology's overall role is to be lead agency for the waterway source control effort. In addition, Ecology will use its regulatory authorities in order to determine the extent of source control needed and to oversee or implement controls as necessary for:

- Properties and activities that discharge directly to the waterway (properties immediately adjacent to, or activities that occur on or in the waterway).
- Contaminated properties that may impact sediments through soil and/or groundwater pathways to the waterway.
- Contaminated properties that may impact sediments through soil and/or groundwater pathways into publicly owned storm drains or sewers that discharge to the waterway.
- When necessary, Ecology will assist local agencies on specific source control issues, and carry out other source control activities as appropriate.

Ecology's responsibilities in the source control program include:

- Develop and provide a Source Control Strategy and area-specific Action Plans.
- Develop and provide an initial information compilation report of potential sources to the waterway.
- Summarize source control status according to the estimated number of known, ongoing sources; the types of source control tools in place; the need for additional information/data; and the number of source control effectiveness and completeness determinations made.
- Collect and track information from other SCWG members on the status of their source control activities (see Documentation, Tracking and Reporting).
- Prepare area-specific status reports as called for in the Action Plans.

- Make final decisions regarding source control effectiveness and completeness, with requirements for additional monitoring or control as appropriate.
- Report the status of source identification and control to EPA twice each year.
- Chair the Source Control Work Group.

## City of Seattle

The City of Seattle owns and operates the municipal separated storm drain system that collects stormwater runoff from upland areas and discharges to the waterway. Under Seattle Municipal Code (SMC) 22.800, the city stormwater, grading, and drainage control code; Seattle Public Utilities (SPU) has authority to require properties discharging to the city-owned system to employ operational controls (e.g. management practices such as spill prevention, regular inspection and maintenance, and employee training) to reduce the amount of pollution discharged to the city system. In addition, for certain high risk generating activities, the City requires that structural source controls (berms, containment, and covering) be installed for all new facilities.

The City also owns and operates the sanitary and combined sewer collection system within the city. These smaller trunklines collect domestic sewage, industrial wastewater, and stormwater from Seattle neighborhoods and discharge to the King County interceptor system, which conveys wastewater to the treatment plant at West Point. The City operates 2 emergency overflows (pump station overflows) and 2 combined sewer overflows in the waterway. Under its National Pollutant Discharge Elimination (NPDES) permit, the City is responsible for discharges or overflows into the waterway that come from the city-owned trunk system. King County regulates the amount of pollution discharged to the sanitary and combined systems in the King County area through the King County Industrial Waste Program (see below).

The City of Seattle's roles in the source control program are to:

- Participate in developing those portions of Action Plans dealing with controlling sources of pollution discharging to the city-owned storm drain system when discharges from the city system may recontaminate sediment cleanup sites.
- Exercise its authority to inspect commercial and industrial businesses and other entities in the areas draining to the city-owned storm drain system, in coordination with sediment cleanups.
- Require businesses and other entities to take actions to meet the City's regulatory requirements when sources of contaminants are found entering the city-owned storm drain system.
- Provide progress reports on source control activities to Ecology and the SCWG for use in reports to EPA.
- Conduct other source control activities as appropriate.

## King County

King County owns and operates the interceptor system, which conveys wastewater to the treatment plant at West Point. Under the NPDES permit for the West Point Plant, the County is responsible for discharges or overflows that occur from the interceptor system. King County operates 9 regulator and pump stations in the Duwamish drainage area and has 8 combined sewer overflow points and 2 emergency overflows in the waterway.

King County has delegated authority from the EPA to regulate the types and amount of pollutants discharged to the sanitary and combined sanitary-storm sewer systems in the King County service area. The County's authority comes from the federal pretreatment regulations in 40CFR403 and related federal effluent limitations. These federal regulations along with Title 28 of the King County Code gives the King County Industrial Waste Program authority to set limits on pollutants discharged, require best management practices and/or the installation of pollution treatment equipment, issue permits to dischargers, monitor, and enforce.

King County's roles in the source control program are to:

- Participate in developing those portions of Action Plans dealing with sources of pollution discharging to the sanitary or combined sanitary-storm sewers tributary to sediment cleanup sites.
- Inspect commercial and industrial businesses and other entities in the areas discharging to sanitary or combined sanitary-storm sewer system draining to sediment cleanup sites.
- Require businesses and other entities to take actions to meet regulatory requirements when sources of contaminants to the sanitary or combined sanitary-storm sewer are found. Take enforcement actions as needed.
- Provide progress reports on source control activities to Ecology and the SCWG for use in reports to EPA.
- Conduct other source control activities as appropriate.

Two agencies of the Local Hazardous Waste Management Plan, King County Hazardous Waste Program and the Environmental Hazards Group of Public Health-Seattle and King County, are also participating in source control efforts. The Local Hazardous Waste Management Program is a regional program focused on helping local residents, business owners and operators, and other institutions use fewer and/or less toxic materials, properly use and store hazardous materials, and properly dispose of hazardous wastes. The roles of these two agencies will be to assist in inspecting commercial and industrial businesses and to provide technical assistance and environmental education.

## Port of Seattle

The Port will cooperate with the other SCWG agencies in implementing the source control program to achieve the goals of this strategy for Port owned properties, which are either operated by the Port or leased to tenants. The Port of Seattle's roles in the source control program are to:

- Take the lead on source control for Port properties that collect and discharge stormwater directly to the waterway.
- Accompany, cooperate, and provide support on source control conducted by the municipalities for Port properties that discharge stormwater to the municipal systems.
- Scope and inspect Port-owned properties for areas/activities that could impact sediments through stormwater discharges, eroding contaminated soils and/or groundwater contamination.
- Take needed actions to meet regulatory requirements when issues are found.
- Share relevant source control information and related environmental data with the SCWG.
- Provide progress reports to Ecology and the SCWG for use in reports to EPA.
- Conduct other source control activities as appropriate.

## City of Tukwila

The City of Tukwila's roles in the source control program are to:

- Participate in developing those portions of Action Plans dealing with controlling sources of pollution discharging to the city-owned storm drain system when discharges from the city system may recontaminate sediment cleanup sites.
- Assist in the inspection of commercial and industrial businesses draining to the city-owned storm drain system, in coordination with sediment cleanups.
- Require businesses and other entities to take actions to meet the City's regulatory requirements when sources of contaminants are found entering the city-owned storm drain system.
- Provide progress reports on source control activities to Ecology and the SCWG for use in reports to EPA.
- Conduct other source control activities as appropriate.



## EPA

EPA has broad roles under the Memorandum of Understanding and this strategy. EPA's roles in the source control program are to:

- Provide technical assistance to Ecology.
- Coordinate source control with EPA-led site sediment investigation and cleanup(s), and as appropriate, require responsible parties to investigate and control sources.
- Coordinate source control with EPA-lead activities in the waterway area.
- Review and concur on the source control strategy and plans, status reports, proposed source control actions, source control reports.
- Determine whether source control actions are sufficient to meet the goals of preventing and/or minimizing the recontamination of sediments.
- When necessary, EPA will assist other public agencies with source control tasks.

## Total Maximum Daily Loads (TMDLs/Pollution Control Plans)

The federal Clean Water Act requires Ecology to identify water bodies that fail to meet water quality standards and to prepare Pollution Control Plans or TMDLs, to improve their health. The Lower Duwamish Waterway is currently 303(d) listed as an impaired water body based upon water quality exceedences of fecal coliform and pH in the water column, and water quality exceedences of PCBs, PAHs, mercury, various other metals, and phthalates in the sediments<sup>1</sup> (Ecology 1998). Through a public process, the agency works with local interests to reduce pollution in a 303(d) listed water body. Ecology is also required to update lists of impaired water bodies. It is likely that additional impairments will be added to Ecology's 2003 303(d) list for the LDW based upon additional water quality exceedences in sediments. The 2003 303(d) list is scheduled to be finalized in the spring/summer of 2004.

Ecology's Water Quality and Toxics Cleanup Programs are responsible for submitting Pollution Control Plans that address water quality impairments based on sediment exceedences to the EPA. These plans may propose and establish conditions in discharge permits and nonpoint-source management plans to reduce pollution, and a monitoring plan to evaluate the effectiveness of the cleanup plan (Ecology 2003b).

Sediment cleanups and source control actions in the LDW will be critical to addressing any 303(d) listed sediment impairments. Ecology's Toxics Cleanup and Water Quality Programs will be coordinating to develop LDW Pollution Control Plan(s) in the 5-year NPDES permit cycle that begins in 2008. Ecology's Toxics Cleanup and Water Quality Programs, and EPA's Superfund and Water Programs have met to coordinate on the LDW water quality impairments based upon sediment exceedences. Further meetings will take place to prepare for LDW Pollution Control Plan development.

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<sup>1</sup> Sediment Management Standards WAC 173-204 are federally approved water quality standards in the State of Washington.

# Persistent Bioaccumulative Toxins

Persistent Bioaccumulative Toxins (PBTs) are both naturally occurring and man-made substances that build up in the food chain and can affect human health and reproduction. These toxins travel long distances in the atmosphere, move readily from land to air and water, and do not break down easily. About two dozen PBTs of concern have been identified in Washington State (Ecology 2000). PBTs that are present in LDW sediments include:

- Banned organic chemicals: PCBs.
- Other organic chemicals: hexachlorobenzene, hexachlorobutadiene.
- Pesticides already banned by U.S. EPA: aldrin/dieldrin, chlordane, DDT/DDD/DDE, heptachlor epoxide, toxaphene.
- Other pesticides: endosulfan, methoxychlor.
- By-products of fossil fuels: dioxins, furans and PAHs.
- Metals: mercury, cadmium and lead.

Ecology's 2000 PBT Strategy includes the following statement that addresses all of the contaminated sediment sites in Washington State:

***Enhance efforts to clean up sediment contamination problems.** Ecology has identified more than 100 sites with sediments that are contaminated with PCBs, mercury and other PBT chemicals. The agency plans to place greater emphasis on establishing site-specific sediment-cleanup requirements to prevent harm to human health and the environment associated with the accumulation of PBT chemicals in the aquatic food chain. Ecology also plans to better integrate sediment cleanup measures with source controls, dredging, and habitat protection projects through a variety of mechanisms, including bay-wide planning and water cleanup plans (total maximum daily loads, or TMDLs).*

Sediment standards for many PBTs are in 173-204 WAC, the Washington State Sediment Management Standards, and these PBTs are being addressed as part of the LDW Remedial Investigation. For example, six of the seven early action areas in the waterway include PCB contamination. Source control efforts for the waterway will also address PBTs that could pose significant recontamination risks to sediments.

More information about Ecology's PBT Strategy can be found at:

<http://www.ecy.wa.gov/programs/eap/env-info.html#pbt>

# Contamination and Pathways

In order to discuss the steps to identify and manage sources, it is important to understand potential sources and pathways to the LDW sediments. Media relevant to source control that can be contaminated by human activity are water, soil, and air. Contaminated media can impact sediments through several pathways, such as groundwater, stormwater discharges, bank erosion and sediment transport, and air pollution. Potential sources can be organized into nine general types based on the origin of contamination, pathways to sediments, and the types of source control available:

1. *Direct discharges*: The direct discharge of pollutants to the waterway from commercial, industrial, private, or municipal outfalls may impact sediment quality, depending on the origin and character of the effluent. Many of these discharges are permitted under the NPDES. Permitted discharges, whether or not they exceed applicable permit levels, may result in sediment contamination. Permitted industries include sand and gravel facilities, boatyards, shipyards and other facilities.
2. *Stormwater pathway*: Stormwater enters the waterway via storm drains and pipes, ditches, creeks, or directly from properties adjacent to the waterway. Stormwater pollution is generated when rain contacts pollutants that have accumulated in or on exposed soils and surfaces, or comes from illegal discharges or illicit connections to storm sewers. Contaminated solids that collect in storm drains/pipes, ditches or creeks may be carried to the waterway by stormwater. In the LDW area, 80 industrial sites are authorized to discharge under the general NPDES permit for industrial stormwater. In addition, 3 individual NPDES permits are active for given industrial operations in the area. The City of Seattle and King County are municipal NPDES permittees for stormwater.
3. *Combined Sewer Overflows (CSOs)*: CSO events are combined discharges of stormwater, municipally permitted industrial discharges, and untreated sewage that is released directly into the waterway during heavy rainfall, when the sewers have reached their capacity. CSO discharges can carry chemicals that impact sediments. The City of Seattle and King County are municipal NPDES permittees for Combined Sewer Overflows.
4. *Groundwater*: Contaminated groundwater may enter directly into the LDW via seeps or it may infiltrate into storm drains/pipes, ditches or creeks that discharge to the waterway.
5. *Erosion/Leaching*: Waterway bank soil, contaminated fill, waste piles, landfills, and surface impoundments may release contaminants directly to the LDW through erosion, via soil erosion to stormwater, or by leaching to groundwater.

6. *Spills, dumping, leaks, and inappropriate housekeeping and management practices:* Spills, dumping and leaks may result in contaminant releases to soil, groundwater, and/or stormwater that may impact sediments. Dumping material such as wood waste or debris directly into the waterway may also impact sediments. Inappropriate management practices either within the storm drain or CSO basins tributary or directly adjacent to the LDW increase the risk of sediment contamination.
7. *Waterway operations and traffic:* Contaminants from riverside docks, wharves and piers, and discharges from vessels (gray, bilge, ballast or other waters), fuel releases and spills may impact sediments. Inappropriate general housekeeping and management practices for waterside construction, vessel fueling, hull maintenance, wastes and other materials at marinas and small boatyards may also impact sediment quality.
8. *Air pollution:* Air pollution can enter the waterway directly or through stormwater, and become a possible source of sediment contamination. Air pollution can be localized, such as paint over-spray, sand-blasting and fugitive dust and particulates from loading/unloading of raw materials such as sand, gravel and concrete or it can be widely-dispersed from vehicle emissions and industrial smokestacks.
9. *Transport of contaminated sediments:* Transport of existing contaminated sediments from up or downstream of the LDW site, or within the site, may occur due to a number of influences. These include significant tidal or flood events, marine traffic, sediment cleanup dredging, or other waterway activities. During planning for sediment cleanup, recontamination potential from other areas of contaminated sediments will be analyzed. During sediment cleanups, dredging best management practices are required to minimize transport of contaminated sediments. If significant sediment contamination is present up or downstream of the site, it may be deposited inside of the site. The issue of sediment transport is outside the scope of this strategy. It will be addressed as part of Phase 2 Remedial Investigation work, and during individual sediment cleanups.

# Steps to Identify and Manage Sources

For each of the source control priority tiers, beginning with Tier 1, potential sources of sediment contamination will be determined through the steps listed below. Although the source control process is presented here as linear, in practice the process is iterative. Information gathered late in the process may cause earlier work or conclusions to be revisited and refined. The steps outlined below will be implemented separately for each source control area. Details on how these steps will be accomplished will be set forth in separate Action Plans (see Goals and Priorities).

1. *Identify sources of chemicals that may contaminate sediments:* Review available information on sediments and potential sources and pathways (e.g., surface water, contaminated upland soils or groundwater). Sources will be evaluated to determine if they pose a recontamination risk to sediments, even if they have not been currently detected in sediments. The information that will help to identify potential sources includes:
  - Sediment data from the Phase 1 and/or Phase 2 RI and other sources, such as sampling conducted outside the RI, to identify potential sources for the relevant basin(s).
  - Data from site assessments of contaminated upland sites.
  - Information about current or historical industrial activities in the area and chemicals potentially associated with those industries.
  - Inspection and/or monitoring reports from relevant agencies identifying potential historic or current sources.
2. *Evaluate source control activities already in place and determine need for additional source control:* Gather information on source control measures that are already in place. Assess their effectiveness and determine what additional source control measures may be needed to prevent or further minimize the potential for sediment recontamination. This step may include:
  - Evaluating reports that document upland contaminated site cleanups and their current condition(s).
  - Conduct additional sampling, either for source identification or to determine source control effectiveness. It may be necessary to gather additional information through sampling to answer questions about either the nature of contamination at a property or the contaminant pathway to sediments. The ability to require sampling is given by most of the authorities and regulations listed in Appendix B of this strategy.
3. *Prioritize sites or pathways where additional source control work is needed:* Using the information above, develop a list of sources to further investigate and/or control, addressing those sources with the highest potential to recontaminate sediments first.

# Tools to Manage Sources

Once potential sources are identified, evaluated, and prioritized, source control begins. Source control is an iterative process, where early steps may be revisited and conclusions refined by information gathered later in the process. Control of sources in one basin may take place at the same time as source identification and mapping in another basin. In addition, discoveries and source identification in one basin may influence source investigations in another. For each potential source, the most efficient source control approach or tool will be identified and used. It may be most effective to use a combination of the following tools to address a particular source or basin:

- *Technical assistance:* All SCWG agencies offer technical assistance that benefits source control efforts. This strategy commits to working cooperatively to help business and industry achieve source control. Technical assistance, often provided during inspections, provides technical information tailored to help individual businesses bring their facilities into compliance with pertinent regulations.
- *Education:* Education is the primary tool to manage residential sources of pollution. Residential sources can contribute significant non-point pollutants, such as metals, PAHs and phthalates, which could recontaminate sediments.
- *Inspections:* An inspection is the first step in controlling sources of chemicals at businesses and other facilities. Inspectors identify potential sources of chemicals of concern, document activities and sources on site, educate business representatives on the regulations, and offer technical assistance to help businesses comply with regulations. The right to inspect is typically written into federal, state, and local regulations to ensure that appropriate actions are taken at regulated facilities or activities. Inspections are often followed by administrative actions.
- *Administrative actions including enforcement:* Administrative actions include licenses, permits, deed restrictions, requirements for site development plans and enforcement actions. Agencies rarely take enforcement actions without first writing memos or letters to record inspection findings, document requested changes, and give warnings and offers of technical assistance. When enforcement actions are warranted, they are usually taken in escalating order, starting with notices of violation, then moving to enforcement or compliance orders requiring specific changes by a specific date, and finally to monetary penalties. Formal cleanups performed under order or decree use oversight and enforcement to ensure that appropriate actions are taken in a timely manner.
- *Upland contaminated site cleanups:* These are cleanups in upland basins that address contaminated soil, groundwater, and stormwater. Cleanup actions vary from site to site, and are typically implemented under Independent, Voluntary or formal Model Toxics Control Act (MTCA) authority; and RCRA and/or Superfund authority.

- *Source control of active discharges:* Tools to control active discharges include best management practices, industrial process changes, pollution prevention practices and technology-based controls of effluent. Compliance is achieved voluntarily or through administrative actions, including enforcement.
- *Stormwater source control:* Stormwater source control is complex because discharges to storm drain systems are affected by many different sources (e.g., land use activities, runoff from contaminated sites, and infiltration of contaminated groundwater into the storm drain system). It is also complex because stormwater regulation involves federal, state and local agencies. Because of this complexity, all of the tools discussed above are useful for stormwater source control and will be used as appropriate by the SCWG agencies.



# Source Control Effectiveness and Completeness

Source control efforts must prevent or minimize the potential for sediment recontamination to occur, and meet other goals and objectives of this strategy (see Goals and Priorities). Specific criteria to measure source control effectiveness and determine when source control is complete for the waterway will be developed in the individual Action Plans. LDW sediment cleanup project managers will coordinate with Ecology to ensure that determinations regarding source control effectiveness and completeness (including monitoring) comply with this strategy. In general, the Action Plans will address the following criteria for effectiveness and completeness:

1. *Source Control Effectiveness*: Monitoring will be required as appropriate to evaluate the effectiveness of source control measures. Ecology and/or EPA will evaluate LDW area sediments, soils, groundwater, and/or water quality monitoring data from various agency and non-agency investigations to assess source control effectiveness. If necessary, Ecology and/or EPA may require additional post-cleanup sampling of soils, surface water, groundwater, or sediments in order to evaluate source control effectiveness. The SCWG agencies will evaluate monitoring needs in each Action Plan, and as part of specific cleanup activities to identify the most appropriate method for measuring source control effectiveness. However, Ecology will make the final determinations regarding source control effectiveness with review and concurrence by EPA. Monitoring or sampling to determine source control effectiveness may include:
  - Monitoring of contaminants in waterway sediments. Direct measurement of contaminant levels in sediments will be useful to assess overall source control effectiveness. Monitoring will determine if recontamination occurs, and if it does, at what rate and to what levels.
  - Pollutant source monitoring. Types of monitoring that may be used include monitoring of CSOs, storm drains, and catch basin and in-line sediments. This information will be used to track and identify sources of the chemicals of concern to waterway sediments and to evaluate whether source contributions have changed either as a result of source control actions or due to changes in businesses operating in a basin.
  - Requests or requirements under local stormwater, industrial or hazardous waste management authorities to sample (catch basin sediment samples).
  - Requests or requirements under cleanup regulations (MTCA, RCRA and Superfund) to install groundwater wells and monitor groundwater to determine whether it might recontaminate sediments.
  - Evaluation of sediment, soils, groundwater, and/or water quality monitoring data from various agencies and non-agency investigations to assess source control effectiveness.

2. *Source Control Completeness:* Source control for the LDW site will be complete when historical sources and/or ongoing discharges of source control contaminants are identified and brought under control through either physical actions (source removal, containment, best management practice implementation, etc.) and/or administrative actions (orders, permits, etc.).

For specific basins or confirmed sources that discharge to the waterway, source control will be complete when Ecology and/or EPA determine that site management and other source control actions have been implemented to the extent that prevents or minimizes the potential for recontamination of sediments. The determination of ‘completeness’ for confirmed sources will be based on the successful use of appropriate tools and/or monitoring to confirm that they have been controlled (collection of soil, groundwater, or sample of site discharges, etc.).

For public and private storm drains and municipal CSO systems, source identification and control must be responsive to the local conditions and source-specific situations. Source control efforts will be documented by local jurisdictions and evaluated by Ecology and EPA to determine whether these actions prevent or minimize recontamination of sediments above the LDW cleanup goals to be set in the EPA ROD. Given the complexity of stormwater sources and discharges, source control efforts will involve coordination between the federal, state, and local agencies with regulatory authority and responsibility to control stormwater sources.

3. *Final Determinations:* Ecology will make the final decisions on source control effectiveness and completeness, with review and concurrence by EPA, as outlined in the April 2002 Ecology/EPA LDW Memorandum of Understanding.

# Documentation, Tracking, and Reporting

Ecology is the lead for tracking, documenting and reporting the status of source control to EPA. In turn, all source control activities will be documented by the appropriate agency performing the source control work. The agencies will provide reports to Ecology, who will provide waterway-wide and basin-specific reports, as noted below.

This strategy divides the management of information and data into two levels. The first level is documentation and tracking, where information is organized so that Ecology can track and manage source control activities at a given source or within a given basin(s). The second level is reporting to EPA. EPA will review but not concur on the work listed under ‘Documentation and Tracking’. EPA will review and concur on the work and deliverables listed under ‘Reporting’.

## Documentation and Tracking

The table below summarizes the documentation and tracking requirements in this strategy:

Table 1. Documentation and Tracking Requirements

Document & Scope	Purpose & Notes	Schedule Frequency	Prepared by	Reviewed by
<i>Source Control Information Compilation</i>  Waterway-wide	<u>Organize, summarize &amp; track</u> information from all programs for potential and identified sources. Will incorporate information from Action Plans.  <u>Track target dates</u> for Action Plans, effectiveness/completion determinations.	Ongoing updates by SCWG members.	Maintained by Ecology.	SCWG Members.
<i>Action Plans</i>  Basin/source specific	<u>Identify &amp; document</u> specific source control authorities, tools and milestone accomplishments for the purpose of controlling a given basin or source.  If SCWG or Ecology identifies significant changes to an Action Plan, an addendum will be prepared to document the change.	Report frequency required by Ecology for Action Plans will vary according to the sediment cleanup schedules, and the nature of the sources.	Finalized by Ecology.	SCWG Members.

## Source Control Information Compilation

This is the waterway-wide summary of potential sources, and the status of source investigations and in-place or pending source control measures. The initial compilation will not be comprehensive. Instead, information on basins and other issues will be added as source identification and control proceeds. The document provides a way to organize and track source information as it accumulates and as source control actions occur. Ecology will maintain this compilation, which will be updated by the SCWG members throughout the life of source control for the LDW site.

Information tracked in this document includes:

- Current names, addresses, and permit information.
- Summary notes from regulatory programs for investigations or actions taken on a site that may be relevant to contaminated media or pathways to sediments.
- Summary notes about past operations or activities that may be relevant to historic contamination.
- ‘Tags’ that identify early action candidate sites and their associated upland basin(s), locations of specific upland properties, or reference specific Action Plan information.
- Dates targeted for issuing source control effectiveness/completion determinations.
- Information generated by Action Plan-specific reporting.

Information identified in the Compilation will remain in program files or archives of the given SCWG agency. Ecology may cite and or copy information from these files to support decisions about whether sources do or do not impact sediments, and determinations of source control effectiveness and completeness (see below).

## Action Plans

Ecology will provide Action Plans to EPA, the SCWG and stakeholders for sources associated with Tier 1 and 2 areas, and Tier 3 areas (if they are necessary). If Tier 4 actions are required, an amendment to an existing Action Plan will be provided. Action Plans serve as documentation to EPA and Ecology files for source control. Depending on the nature of the source control tools used to implement a given Action Plan, the types and timing of reports to the Compilation may vary. Action Plans will describe how elements of this strategy will be implemented for a given source(s) and will document the following:

- Status of contaminated media and pathways.
- Plan and authorities to be used for completing source identification and characterization, including collection of any additional environmental data.
- Actions/tools appropriate for controlling sources, including monitoring requirements for the occurrence of recontamination.
- Criteria or other goals to be met for Ecology to determine effectiveness and completeness of source control.
- Target dates for providing the items above.

Ecology will provide Action Plans to EPA for review with the understanding that target dates may be subject to change depending on the identification of new or additional contamination or pathways to sediments. Changes to target dates noted in Action Plans will be reported to EPA in the Source Control Status Updates (see below) and be tracked in the Compilation. Significant changes to Action Plans will be provided as amendments to existing documents.

## Reporting

The table below summarizes the reporting requirements in this strategy:

Table 2. Reporting Requirements

Document & Scope	Purpose & Notes	Schedule Frequency	Prepared by	Reviewed by
<i>Initial Source Control Status Report</i> Waterway-wide	Based on information in the Compilation, summary information (see below for detail).	Prepared once as initial reference (targeted for June 2004).	Written report & management briefing prepared by Ecology.	EPA reviews and concurs.
<i>Source Control Status Updates</i> Waterway-wide	Semi-annual update of the Initial Source Control Status Report (see below for detail).	Semi-annual updates to the Compilation (updates targeted for February/August each year).	Written report & management briefing prepared by Ecology.	EPA reviews and concurs.
<i>Source Control Effectiveness &amp; Completeness Determinations</i> Basin/source specific	Document evaluation of data, other information re source control contaminants, media, pathways with respect to implemented source control and recontamination potential for sediments.	Once per source or basin.	Ecology prepares memo, letter, or report (see below).	EPA reviews and concurs.

## Initial Source Control Status Report

Ecology will provide an initial Status Report to EPA for review and concurrence, based on the information contained in the Compilation. The Status Report will be waterway-wide, and organized according to the tiered priority areas (see Goals and Priorities). This report will serve as documentation to EPA and Ecology files for progress on waterway-wide source control. In addition to the written report, Ecology will brief EPA program management on this report.

Summary information shall include the following as appropriate:

- Estimated number of known ongoing and historical sources:
  - Types of source controls in place (see Tools to Manage Sources).
  - Estimated number (list by name/address) where source control effectiveness and completeness can be assessed.

- Estimated number (list by name/address) where source control effectiveness and completeness cannot be assessed, and the target dates for completing assessments.
- Estimated number of Action Plans needed.
- Schedules for developing and implementing Action Plans, meeting data/info needs to confirm sources, and achieving effectiveness and completeness determinations.
- Estimated number of suspected sources requiring further investigation, and additional information to make effectiveness/completeness determinations:
  - List by name and address for information and data gaps to be filled.
  - Identify the type of media/pathway involved and gaps in data and/or information (no program records, no confirmation sampling data).
  - Identify how to fill gap (programs/agencies/authorities, inspections, sampling).
  - Estimate times for completing further investigation or getting additional information, and determining effectiveness/completion.
- As appropriate, the agencies will collect information and/or make estimates of the volume/weight/cost/etc. of contaminants removed, contained, treated or otherwise controlled, in order to help communicate to stakeholders on the progress of source control work.
- As appropriate, maps will be revised and attached to Source Control Status Updates when significant changes are discovered and made.

## Source Control Status Updates

Ecology will provide these semi-annual Status Updates to EPA for review and concurrence. These will be waterway-wide, organized according to the tiered priority areas, and will summarize the information tracked by the Compilation. In addition to tracking and summarizing the numbers of sources and source control accomplishments, Status Updates will also document issues that may affect the ability of Ecology or other agencies to perform source control. The report will serve as documentation of progress on waterway-wide source control. In addition to the written report, Ecology will brief EPA program management on the information in this report.

Status Update reports shall include the following information (as appropriate):

- List of sources discovered since the previous report.
- Changes to estimates made in the Status Report.
- List and description of issues affecting source identification, characterization, or source control work.

- Summary information for any source control effectiveness/completeness determinations made since last report, including:
  - Name/address of source.
  - Nature of contamination/pathway.
  - Source control tools applied.
  - Quantitative information regarding source control achieved, where possible (e.g., lbs pollutant removed from environment).
  - Outstanding issues (monitoring, institutional controls, etc.).
- List of target dates for effectiveness/completeness determinations that have changed and reasons why.
- Identify issues affecting ability to make source control effectiveness/completion determinations, for any step of the source control process (i.e., identification, characterization, implementation), and propose ways to resolve and target date/timeframe for resolution.
- As appropriate, the agencies will collect information and/or make estimates of the volume/weight/cost/etc. of contaminants removed, contained, treated or otherwise controlled, in order to help communicate to stakeholders on the progress of source control activities.

## Source Control Effectiveness and Completeness Determinations

Ecology will provide Completeness Determinations to EPA for review and concurrence. These determinations may be developed in memo, letter or report format as appropriate for the amount of information supporting the determination.

Three types of Completeness Determinations will be made:

1. For a particular Action Plan or source, a final determination will be made when the Plan or source control action has been fully implemented, in order to document completion.
2. For Tier 3 basins or sources where an evaluation determines that no further source control action is needed, a final determination will be made to document the NFA decision.
3. A final determination will be made when all of the individual Action Plans are completed for the LDW site.

These determinations shall contain and address the following as appropriate:

- Description and discussion of the nature of contamination, and pathway(s) to waterway sediments.
- Regulatory or other tools used for source control including monitoring.
- Map(s) of the site or basin(s).
- Criteria relevant to determining source control effectiveness and completeness for the source/area including but not limited to:
  - Upland sites cleanup information.
  - Surface water or sediment quality information.
  - Other site-specific criteria as may be applicable (local limits in permits, pre-existing cleanup goals determined protective of waterway sediments, or Pollution Control Plans).
- Chronology of site to include:
  - Occupancy and operations conducted on the site.
  - Environmental actions taken to-date.
  - Steps taken for further source characterization and control.
  - Sampling events for data used to support this determination.
- Data used to support the effectiveness/completeness determination and noted on the site chronology, either as appendices to the report or summarized in tables.
- Full citations for data or other reports/information supporting determination of effectiveness/completeness.
- In addition, when appropriate the agencies will collect information and/or make estimates of the volume/weight/cost/etc. of contaminants removed, contained, treated or otherwise controlled, in order to help communicate to stakeholders on the progress of source control work.



## Public Involvement

This strategy and the Action Plans (as they are developed) will be distributed to interested stakeholders, including the Duwamish River Cleanup Coalition (the site public advisory group), the Source Control Work Group, and the Lower Duwamish Waterway Group for review and comment. All final decisions on this Strategy and the Action Plans will be made by Ecology, with review and concurrence by EPA.

Public involvement requirements will be followed per the regulatory authorities used to implement source control. In addition, forums, presentations and meetings will be held with interested parties as appropriate to explain source control activities and plans, and to supplement source information with local knowledge. Updates on source control activities will be included in fact sheets prepared for the LDW site, and be part of the agenda for regular quarterly meetings between Ecology, EPA and the LDW stakeholders.

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## Appendix A

### Draft Action Plan Table of Contents for Duwamish/Diagonal Way

## Table of Contents

	<u>Page</u>
List of Figures and Tables.....	
Abstract .....	
Acknowledgements.....	
Executive Summary .....	
Lower Duwamish Waterway Site .....	
Lower Duwamish Waterway Source Control Strategy.....	
Source Control Work Group .....	
Duwamish/Diagonal Sediment Site .....	
Potential Sources and Chemicals that may Impact Duwamish/Diagonal Sediments .....	
Piped Outfalls.....	
Diagonal Avenue South Combined Sewer Overflow/Storm Drain.....	
Duwamish Pump Station Emergency Overflow.....	
Diagonal Avenue South Storm Drain.....	
Nevada Street Storm Drain.....	
Former Diagonal Avenue Wastewater Treatment Plant Outfall .....	
Direct Stormwater Discharges .....	
Upland Contaminated Sites.....	
Port of Seattle Terminal 106.....	
Port of Seattle Terminal 108/Chevron (Chiyoda) Property.....	
Other Upland Contaminated Sites/LUSTs/USTs .....	
Ongoing Source Control Programs and Authorities .....	
City of Seattle .....	
Stormwater Pollution Prevention Program.....	
Business Inspection Program .....	
Private Drainage System Maintenance Program .....	
Water Quality Complaint and Spill Response Programs .....	
Drainage Operations and Maintenance .....	
SPU Source Tracing Efforts in Diagonal Ave S CSO/SD .....	
Diagonal Drain Cleaning Project.....	
Seattle CSO Control Program .....	

King County.....	
Industrial Pretreatment Program.....	
Local Hazardous Waste Management Program in King County .....	
King County CSO Control Program.....	
Port of Seattle.....	
Washington Department of Ecology.....	
Toxics Cleanup Program .....	
Water Quality Program.....	
Hazardous Waste and Toxics Reduction Program.....	
Spill Prevention, Preparedness and Response Program.....	
U.S. Environmental Protection Agency.....	
Source Control Actions Specific to Duwamish/Diagonal.....	
City of Seattle Actions .....	
1996/1997 Inspections.....	
2003 Diagonal Storm Drain Cleaning Project.....	
King County/City of Seattle Joint Actions .....	
2003 Duwamish/Diagonal Multi-Agency Inspection Project	
Phthalate Study .....	
Port of Seattle Actions .....	
Stormwater Protection .....	
Terminal 108 Groundwater Pathway Investigations	
Ecology Actions.....	
Upland Contaminated Sites/LUSTs .....	
Underground Storage Tank Leak Prevention .....	
Monitoring .....	
Tracking and Reporting of Source Control Activities .....	
References.....	
Appendices	
A. Duwamish/Diagonal Action Items	
B. Map Key of Confirmed and Suspected Contaminated Sites	
C. Map Key of Leaking Underground Storage Tank Sites	
D. Map Key of Underground Storage Tanks	
E. Joint Inspection Form	
F. Joint Inspection Guidance	

## Appendix B

### Agency Authorities and Regulations

Authorities and regulations of the SCWG, and other agencies with responsibility for source issues in the Lower Duwamish Waterway area are listed below. The geographic coverage of these authorities is also noted. These authorities include:

1. *Department of Ecology*: Permits, licenses, orders, decrees, notices issued pursuant to, Chapter 90.48 RCW Water Pollution Control, Chapter 173-201a WAC Water Quality Standards for Surface Waters of the State of Washington, Chapter 173-216 WAC State Waste Discharge Permit Program, Chapter 173-220 WAC National Pollutant Discharge Elimination System Permit Program, Chapter 173-204 WAC Sediment Management Standards, Chapter 173-340 WAC Model Toxics Control Act, Chapter 173-360 Underground Storage Tank Regulations, Chapter 173-303 Dangerous Waste Regulations, and Chapter 173-400 WAC General Regulations for Air Pollution Sources, and the State Environmental Policy Act. When needed, Ecology authority may be used to fill identified regulatory gaps in source control activities. Ecology's authorities are applicable to the entire LDW area.
2. *King County*: Permits, licenses, orders, decrees, notices issued pursuant to King County Code Title 28, Metropolitan Services including Ch. 28.84 Water Pollution Abatement, especially Section 28.84.060, Industrial Waste Rules and Regulations. These authorities apply to King County municipal wastewater and stormwater conveyances in the LDW area.

Other King County regulations that apply primarily to unincorporated areas include Title 9 (Surface Water Management), 10 (Solid Waste), 13 (Water and Sewer Systems). A small portion of the South Park neighborhood along the river is unincorporated King County (see Figure 4).

3. *City of Seattle*: Permits, licenses, orders, decrees, and notices issued pursuant to municipal code chapters pertaining to stormwater and wastewater (SMC 22.800 and 21.16), and accompanying technical manuals (Vol. 1 Source Control, Vol. 2 Construction Stormwater Control, Vol. 3 Flow Control and Vol. 4 Stormwater Treatment). These authorities apply to areas within the Seattle city limits.
4. *Port of Seattle*: The Port and its tenants must comply with the appropriate federal, state, county, and city regulations that address source control issues. The Port of Seattle has the authority through its leases to inspect its own properties, and request that tenants comply with the appropriate source control regulations. The Port has a multi-phased tenant compliance program that includes an environmental review of all proposed new and renewing tenant leases, a walk-through with each tenant upon occupancy and exit, and periodic multi-media inspections depending on the type of activity conducted by the tenant. On occasion, the inspections are conducted jointly with state and local regulatory agencies. The Port also conducts a compliance inspection program that focuses on the industrial tenants whose activities can adversely impact stormwater discharges. These include container terminal and dock operations, cargo shippers, fishing vessel berthing, barge

loading and unloading, grain terminal operations, boat and ship yards, and marinas. The Port evaluates the activities that can impact stormwater discharges and recommends implementation of appropriate Best Management Practices. The Port inspects all hazardous waste generating activities, usage, and storage of hazardous materials, and maintenance activities on Port property. If compliance cannot be achieved, the Port will refer the matter directly to the appropriate agency whose regulation is affected.

5. *Environmental Protection Agency*: Clean Air Act (42 U.S.C., s/s 7401 *et seq.* (1970)), Clean Water Act (42 U.S.C., s/s 1251, *et seq.* (1977)), Resource Conservation and Recovery Act (42 U.S.C., s/s 321 *et seq.* (1976)), Oil Pollution Act of 1990 (33 U.S.C., s/s 2702 to 2761), Pollution Prevention Act (42 U.S.C. 13101 and 13102 *et seq.* (1990)), Toxic Substances Control Act (15 U.S.C., s/s 2601 *et seq.* (1976)), Comprehensive Environmental Response Conservation and Liability Act (42 U.S.C., s/s 9601 *et seq.* (1980), as amended), , and the pertinent sections of the Code of Federal Regulations, policies, and guidelines. These authorities apply to the entire LDW area.
6. *City of Tukwila*: Code Titles 6 (Health and Sanitation), 14 (Water and Sewer), 21 (Environmental) and 22 (Solid Waste). These authorities apply to areas of the Tukwila city limits.
7. *Washington State Department of Transportation*: The Department of Transportation must comply with the appropriate federal, state, county, and city regulations that address source control issues in the LDW area.
8. *Puget Sound Clean Air Authority*: Permits, licenses, orders, decrees, and notices issued pursuant to Regulations I, II, and III, pertaining to emissions, fugitive particulates, new or existing sources, compliance, and enforcement. These authorities apply to the entire LDW area.
9. *Seattle/King County Department of Public Health*: This agency conducts Site Hazard Assessments under an Ecology grant, that result in either a no further action designation, or a site ranking using Ecology's contaminated site ranking system (WARM). Ecology then uses these rankings to prioritize site cleanups. These authorities apply to the entire LDW area.